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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,327	12/03/2001	Satoru Tomekawa	56937-043	5544
20277	7590	11/18/2004	EXAMINER	
MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			LEWIS, MONICA	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,327

Applicant(s)

TOMEKAWA ET AL.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,9 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,9 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. This action is in response to the request for continued examination filed

August 24, 2004.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/24/04 has been entered.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claim 1, 2, 4-6, 8, 9 and 13 are rejected under 35 U.S.C. 103(a) as obvious over Sasaoka et al. (U.S. Patent No. 6,010,769) and Andou et al. (European Patent No EP0961533A2).

In regards to claim 1, Sasaoka et al. ("Sasaoka") discloses the following:

- a) an insulating base comprising prepreg (11b) (For Example: See Figure 1, Column 1 Line 66 and Column 24 Line 1);
- b) wiring layers comprising copper foil (12 and 13) provided disposed on said insulating base (For Example: See Figure 1 and Column 22 Lines 7-10); and
- c) a conductor comprising a conductive powder and a thermosetting resin (14) provided disposed in said insulating base to electrically connect between said wiring layers in an interlayer of said insulating base (For Example: See Figure 1 and Column 15 Lines 29-47).

In regards to claim 1, Sasaoka fails to expressly state the following:

- a) a region containing a resin component provided at a bonding site between said wiring layers and said insulating base adjacent said conductor.

However, Andou et al. ("Andou") discloses a region containing a resin component (101) provided at a bonding site between wiring layers (107) and an insulating base (102) adjacent a conductor (105) (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Sasaoka to include a region containing a resin component provided at a bonding site between wiring layers and an insulating base adjacent a conductor as disclosed in Andou because it aids in providing a means to embed the wiring layer (For Example: See Paragraph 44). (Note: Andou states that the resin is semi-cured, therefore, the resin layer will contain uncured portions. Moreover, when the resin layer of Andou is initially deposited, it is uncured. Since, the present claims are product claims, the claimed product is rendered obvious by the resin of Andou prior to curing, that is, as the resin is initially deposited.)

Additionally, since Sasaoka and Andou are both from the same field of endeavor (semiconductors), the purpose disclosed by Andou would have been recognized in the pertinent art of Sasaoka.

Finally, the following limitation makes it a product by process claim: a) "an uncured resin." The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "*product by process*" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "*product by, all of*" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "*product by process*" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

b) the bonding strength between the wiring layers and the conductor is greater than the bonding strength between the wiring layers and said insulating base.

Since the same materials are utilized the bonding strength between the wiring layers and the conductor would be greater than the bonding strength between the wiring

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layers and said insulating base (For Example: See Figure 1, Column 15 Lines 15-67, Column 16 Lines 1-57, Column 21 Lines 18-67 and Column 22 Lines 1-20).

In regards to claim 2, Sasaoka discloses the following:

a) conductor contains a resin composition (For Example: See Column 15 Lines 15-67, Column 16 Lines 1-57, Column 21 Lines 18-23).

In regards to claim 2, Sasaoka fails to expressly state the following:

a) glass transition temperature of the resin composition is set lower than a glass transition temperature of a resin composition contained in said insulating base.

Since the same materials are utilized the glass transition temperature of the resin composition is set lower than a glass transition temperature of a resin composition contained in said insulating base (For Example: See Figure 1, Column 15 Lines 15-67, Column 16 Lines 1-57, Column 21 Lines 18-67 and Column 22 Lines 1-20).

In regards to claim 4, Sasaoka fails to expressly state the following:

a) the bonding strength between said wiring layers and said conductor is greater than the bonding strength between said wiring layers and said insulating base in an area of the wiring layer adjacent said conductor.

Since the same materials are utilized the bonding strength between said wiring layers and said conductor is greater than the bonding strength between said wiring layers and said insulating base in an area of the wiring layer adjacent said conductor (For Example: See Figure 1, Column 15 Lines 15-67, Column 16 Lines 1-57, Column 21 Lines 18-67 and Column 22 Lines 1-20).

In regards to claim 5, Sasaoka discloses the following:

a) metal cohesion is applied between said conductor and said wiring layers (For Example: See Figure 1).

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In regards to claim 6, Sasaoka discloses the following:

a) a non-bonding region is provided at a part of a bonding site between said wiring layers and said insulating base adjacent said conductor (For Example: See Figure 1).

In regards to claim 8, Sasaoka discloses the following:

a) a surface irregularity formed between said conductor and said wiring layers (For Example: See Figure 1).

In regards to claim 9, Sasaoka discloses the following:

- a) an insulating base (For Example: See Figure 1); and
- b) a conductor provided in said insulating base to electrically connect to an interlayer of said insulating base (For Example: See Figure 1).

In regards to claim 9, Sasaoka fails to expressly state the following:

a) a region containing a resin component provided at a bonding site between said wiring layers and said insulating base adjacent said conductor.

However, Andou discloses a region containing a resin component (101) provided at a bonding site between wiring layers (107) and an insulating base (102) adjacent a conductor (105) (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Sasaoka to include a region containing a resin component provided at a bonding site between wiring layers and an insulating base adjacent a conductor as disclosed in Andou because it aids in providing a means to embed the wiring layer (For Example: See Paragraph 44). (Note: Andou states that the resin is semi-cured, therefore, the resin layer will contain uncured portions. Moreover, when the resin layer of Andou is initially deposited, it is uncured. Since, the present claims are product claims, the claimed product is rendered obvious by the resin of Andou prior to curing, that is, as the resin is initially deposited.)

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Additionally, since Sasaoka and Andou are both from the same field of endeavor (semiconductors), the purpose disclosed by Andou would have been recognized in the pertinent art of Sasaoka.

Finally, the following limitation makes it a product by process claim: a) "an uncured resin." The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "*product by process*" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "*product by, all of*" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "*product by process*" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

b) a tensile strength of said conductor is greater than a bonding strength between said insulating base on a wall surface of said conductor.

Since the same materials are utilized the tensile strength of said conductor is greater than a bonding strength between said insulating base on a wall surface of said conductor (For Example: See Figure 1, Column 15 Lines 15-67, Column 16 Lines 1-57, Column 21 Lines 18-67 and Column 22 Lines 1-20).

In regards to claim 13, Sasaoka discloses the following:

a) region has a conductor and a resin included in the conductor (For Example: See Figure 1 and Column 15 Lines 29-47).

Finally, the following limitation makes it a product by process claim: a) "an uncured resin." The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

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6. Claim 3 is rejected under 35 U.S.C. 103(a) as obvious over Sasaoka et al. (U.S. Patent No. 6,010,769) in view of Hayashi et al. (U.S. Patent No. 6,143,116).

In regards to claim 3, Sasaoka discloses the following:

a) insulating base and said conductor contain a thermosetting epoxy resin composition (For Example: See Column 15 Lines 15-67, Column 16 Lines 1-57 and Column 21 Lines 18-67).

In regards to claim 3, Sasaoka fails to disclose the following:

a) the volume content of the thermosetting epoxy resin in said conductor is set larger than a volume content of the thermosetting epoxy resin in said insulating base.

However, Hayashi discloses the volume content of the resin in the conductor is larger than the content in the insulating base (For Example: See Column 5 Lines 1-67, Column 2 Lines 1-67 and Column 9 Lines 4-11). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Sasaoka to include the volume content of the resin in the conductor is larger than the content in the insulating base as disclosed in Hayashi because it aids in providing a highly reliable connection (For Example: See Abstract).

Additionally, since Sasaoka and Hayashi are both from the same field of endeavor (semiconductors), the purpose disclosed by Hayashi would have been recognized in the pertinent art of Sasaoka.

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Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML
November 15, 2004



**Mary Wilczewski
Primary Examiner**